Change Time Steps

Introduction

From it's inception, EnSight has been used extensively to postprocess time-varying or transient data. In many cases, dynamic phenomena can only be understood through interactive exploration. The Solution Time Quick Interaction area provides the interface for working with transient data and provides comprehensive control over time handling.

Basic Operation

EnSight provides two ways to work with transient data. By default, time is presented as a series of discrete steps running from zero to the total number of steps minus one. However, you can also present time based on the actual simulation time values found in your results data. The presentation mode is controlled by the Time As pulldown menu. In the dialog below, Time As is set to Step and time is presented as discrete steps running from 0 to 159 (160 total steps). The simulation time (as reported in the top line of the dialog) runs from 1.0 to 160.0.

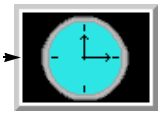
The current time range is displayed in the Beg and End fields with the current time step shown in the Cur field. You can modify the time range displayed in the slider by editing the Beg and/or End fields (remember to press return). You can change the current time step by editing the Cur field (press return), manipulating the slider, or clicking the left/right slider arrows. Clicking Reset Time Range will reset Beg and End to the full range.

Time scaling and stepping (as manipulated through the slider bar and Beg, Cur, and End fields) can either be Discrete or Continuous. If scaling is Discrete, only your actual time steps as written in the results data can be visualized. In addition, the Beg, Cur, and End fields can only be set to integer values (if Time As is set to Step and Scale Type is Discrete) or actual simulation times represented in your results data (if Time As is set to Sim. Time). If scaling is Continuous, you can display results between your actual output time steps (all variable values are linearly interpolated between the two surrounding time steps). Note that if your mesh is changing over time (either set of elements or element connectivity) you cannot display results continuously.

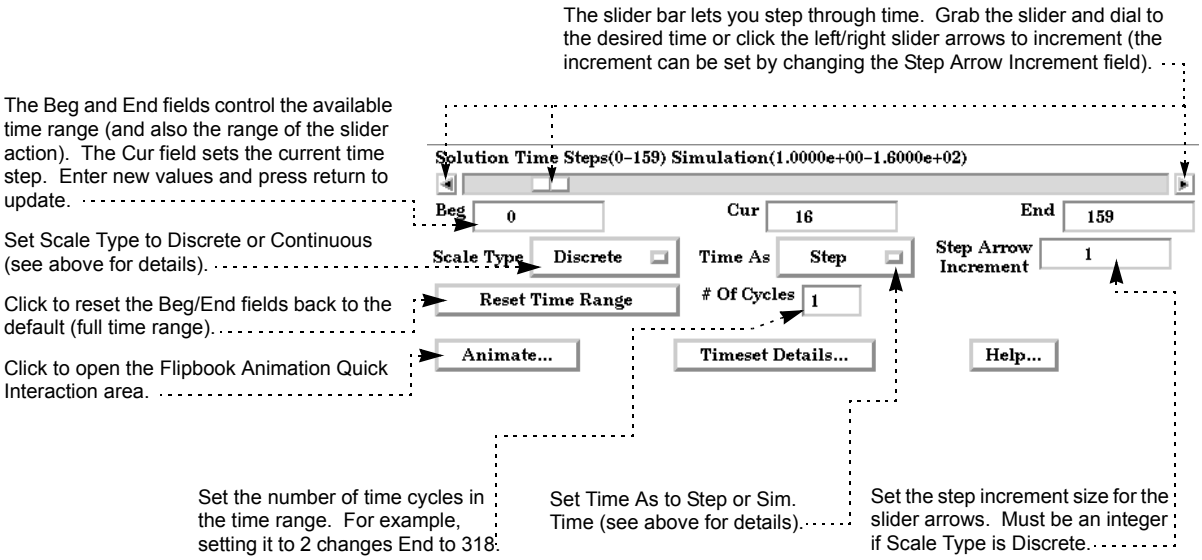
When you manipulate the slider or change the Cur field, EnSight will perform all tasks necessary to correctly display the new time step in the Graphics Window. Depending on the size of the dataset and the number of additional parts you have created, this may take a significant amount of time. If you wish to create an on-screen animation of your results, use the **Flipbook** facility (click Animate Over Time to quickly jump to the Flipbook Quick Interaction area).

To use the Solution Time Quick Interaction area:

1. **Click the Solution Time icon in the Feature Icon bar.**



2. **Make changes as desired.**



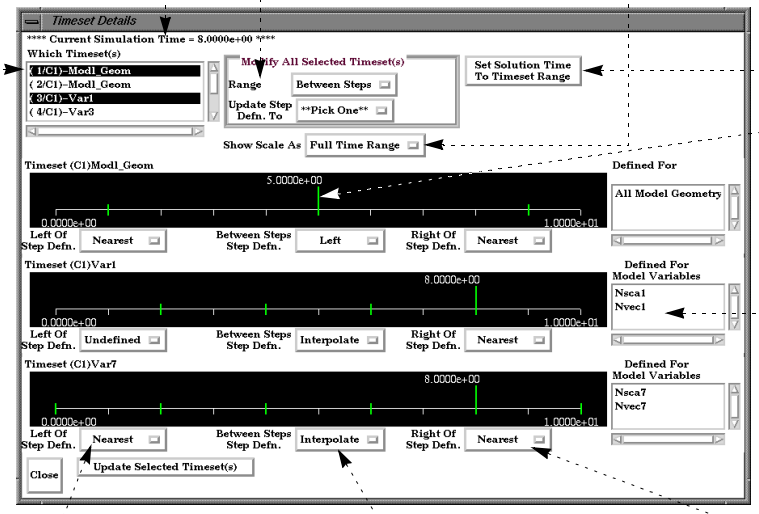
Advanced Usage

EnSight allows geometry and variables to behave in a transient manner on different timelines, i.e., a variable called Temperature can be defined at t = 0., 3., and 6. while a variable called Pressure can be defined at t = 0., 2., and 5.5. The Timeset Details button will bring up the Timeset Details dialog which allows the user to view the various timelines as well as specify how the variables will behave when they are not defined.

The EnSight case file defines the timesets (name and associated time values) and associates a timeset with each of the variables and geometry.

By default the Solution Time dialog will show a composite of all of the timesteps that exist across all of the timesets. This can, however be changed to show just the time values associated with a particular timeset.

In the Timeset Details dialog shown below, multiple timesets exists. Three timesets (from the Which Timeset(s) list) are selected and are thus shown in detail. The graphics for each timeset shows (a) the minimum and maximum overall time value, (b) white tick marks immediately under the timeline indicate the total (composite) time values available from the solution time dialog, (c) green tick marks indicating the time values defined for the timeset, (d) the current time value (indicated with the long green line) associated with the timeset.



The current solution time (as set in the Solution Time dialog.

Select the timeline to be viewed.

To modify all the timelines to behave the same way, select which range is to be modified, then select how they will be displayed.

The timeset can either be shown having a time range over the total number of time values or can be shown according to the timeset's range.

By default the Solution Time dialog shows the composite timeline. This button will modify the Solution Time dialog's Beg and End values to those of the selected timeset.

Shows the time value being used at the current time.

The timeset is used by the variables (or geometry) shown in this list.

When the current time (from the Solution Time dialog and indicated in the upper left corner of this dialog) is set to a value less than what is available for this timeline, use the Nearest value or make the variable Undefined.

When the current time (from the Solution Time dialog and indicated in the upper left corner of this dialog) is set to a value that does not exist for this timeline, Interpolate between defined time values, use the Left, Right, or Nearest value, or make the variable Undefined.

When the current time (from the Solution Time dialog and indicated in the upper left corner of this dialog) is set to a value greater than what is available for this timeline, use the Nearest value or make the variable Undefined.

See Also

How To Load Transient Data, **How To Animate Transient Data**

User Manual: **Solution Time**